Surface Water Drainage Narative/Report

121910

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Engineering ABOVE The Standard.

Layton Crossing (Lots 1 and 2)
City of Shoreline, WA
(Individual Building Permit)

Prepared By:
LDC, Inc.
14201 NE 200th Street, #100
Woodinville, WA 98072

Prepared For:
Wyndham Homes, LLC
16108 Ash Way, #201
Lynwood, Washington 98087

LDC
THE CIVIL ENGINEERING GROUP

Civil Engineering • Land Survey • Land Use Planning

www.LDCcorp.com

Surface Water Drainage Narrative/Report

For Single Family Residential Building Permits at

Layton Crossing (Lots 1 and 2)

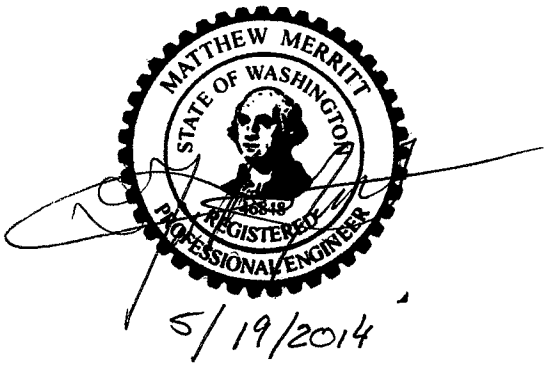
14521 11th Ave NE
Shoreline, WA 98155

Prepared for

Wyndham Homes, LLC
16108 Ash Way, Suite 201
Lynnwood, WA 98087
(425) 775-5238

Prepared by

LDC, Inc.
14201 NE 200th Street, #100
Woodinville, WA 8072
(425) 806-1869



May, 2014 *Job No: 13-173*

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3	Site and Basin Assessment • Figure 4 - Downstream Analysis
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5	Onsite Stormwater Management
6	Conveyance *no conveyance systems
7	Special Reports and Studies
8	Other Permits
9	Project Engineer's Certification
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1.0 PROJECT OVERVIEW

The Alston Heights project is located at 14521 11th Ave NE; Shoreline, WA (tax parcels 663290-0830) and lies within the southeast quarter of the southeast quarter of Section 17, Township 26 N, Range 4 E, W.M. See the Vicinity Map, Figure 1, for the exact location of the site.

Two single family lots are present on the site, but structures previously developed on the lots were demolished by the previous owner. Lot 1 (westerly lot) is 54,123ft^2 while Lot 2 (easterly lot) is 15,234ft^2. A single family home is to be constructed on each lot with drive accesses (single shared access to NE 145th St - WSDOT ROW), utilities and onsite stormwater management facilties.

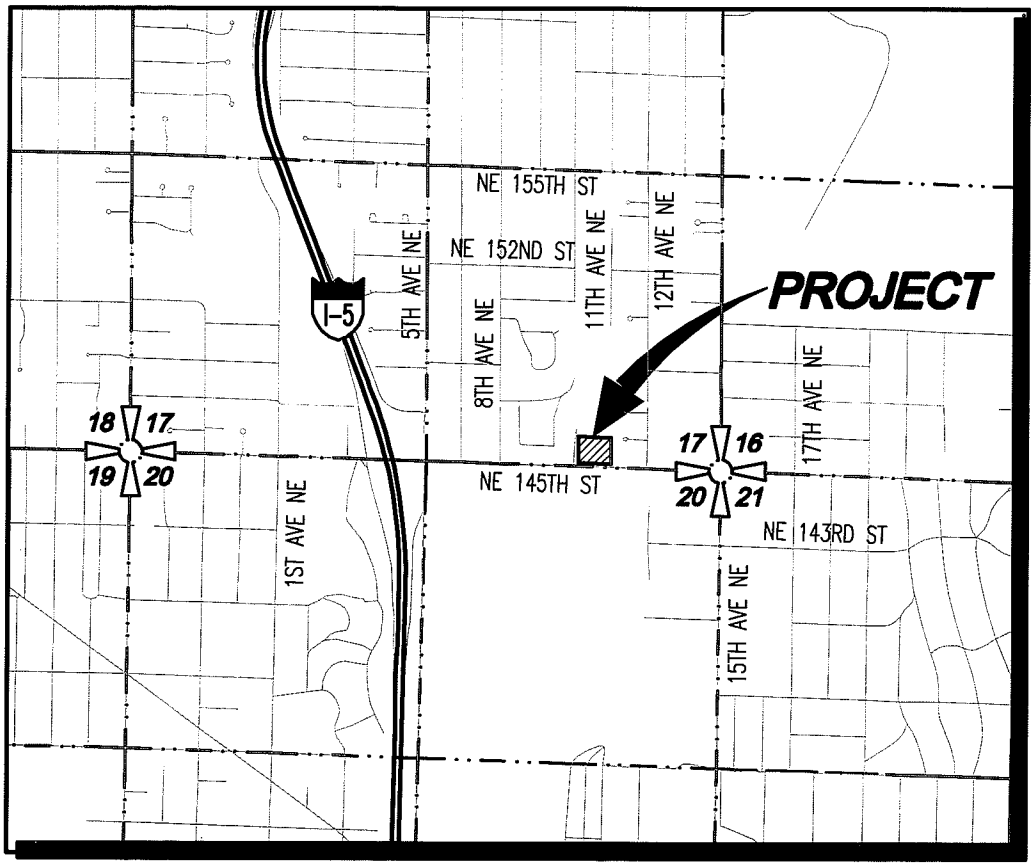
According to subsurface soils exploration accomplished by the geotechnical engineer (Earth Solutions NW), the site is underlain with Vashon glacial till (Qvt) and Vashon recessional outwash (Qvr). The soil has slow to moderate runoff potential and a slight to moderate erosion potential. Alderwood soils are classified as Hydraulic Soil Group 'C', and the Geotechnical Engineer has provided a long term design infiltration rate for the soil of 0.3in/hr.

Lot1 Slopes:
Slopes on the south property line (collinear with the northerly NE 145th St ROW) are more than 40%, and were man-made during the construction of the 145th St. section. Slopes on the west and north in the steep-slope areas range from 15% to 40%, and are identified as Ctitical Area. The central and easterly portions of lot 1 slope more gradually to the east and south from 5% to 30%.

Lot 2 Slopes:
Slopes range from 1 to 18 percent to the south and east. Runoff exits Lot 1 into the 145th ROW and the easterly adjacent lot as sheet flow.

Flows for both lots eventually enter Little Creek, and then Thornton Creek within the ¼-mile limit.

New Impervious area within Lots 1 and 2 are both greater than 5,000SF and so Minimum Requirements 1-9 of the 2012 DOE SWMMWW must be addressed for all impervious and converted areas within each lot. Neither Water Quality nor Flow Control thresholds are triggered, however, so neither water quality treatment nor flow control BMP's are required (beyond that provided by Onsite Stormwater Management BMP's designed to comply with MR #5).



VICINITY MAP

NOT TO SCALE

Drawing: P:\2013\13-173 Layton Crossing\Exhibits\13173E-Vicinity Map.dwg Plotted: May 19, 2014 - 9:23am

LDC
THE CIVIL ENGINEERING GROUP

Engineering
Structural
Planning
Survey

14201 NE 200th St., #100
Woodinville, WA 98072

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www.LDCcorp.com

WYNDHAM HOMES, LLC

LAYTON CROSSING
2 LOTS (SHORELINE)

VICINITY MAP

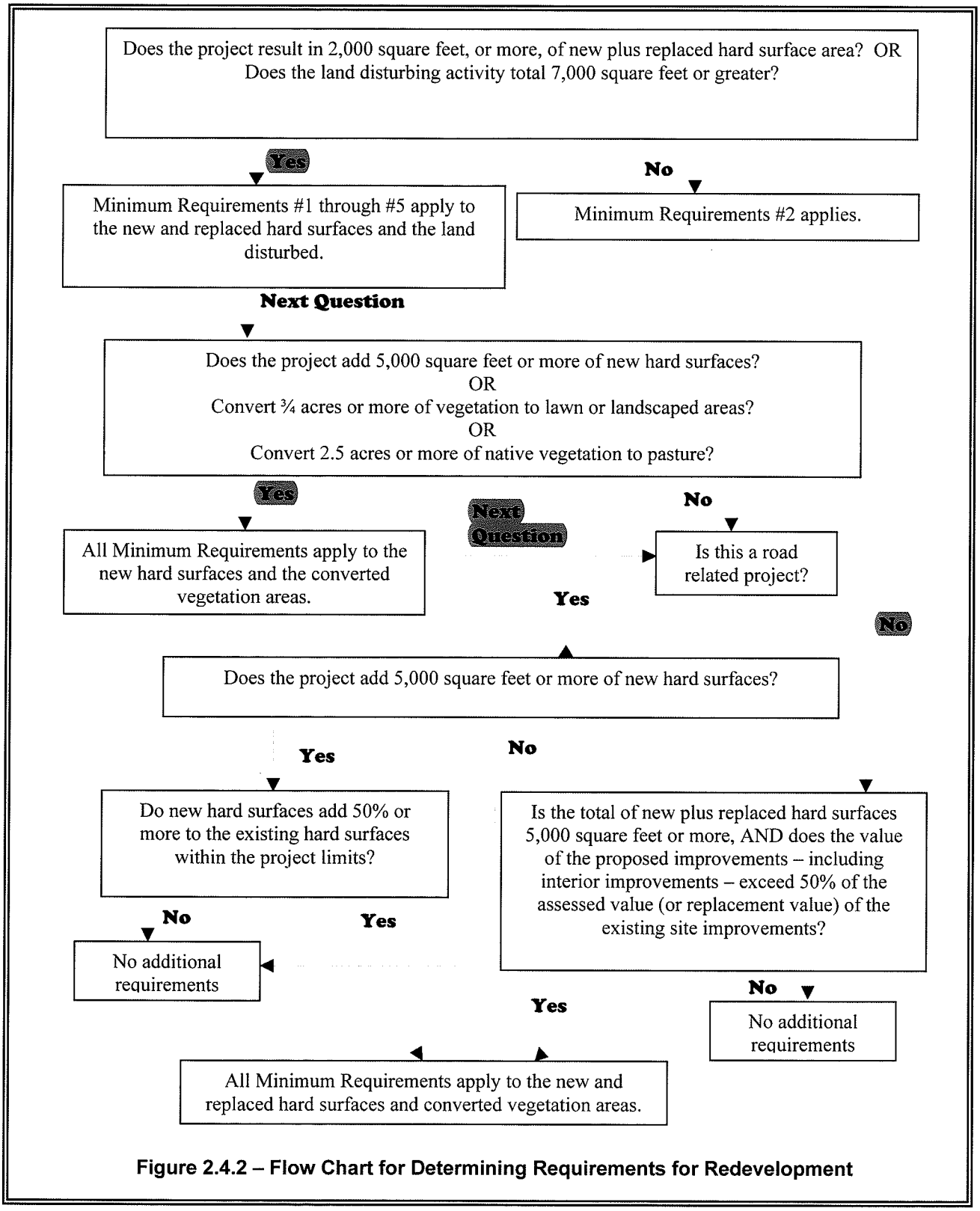
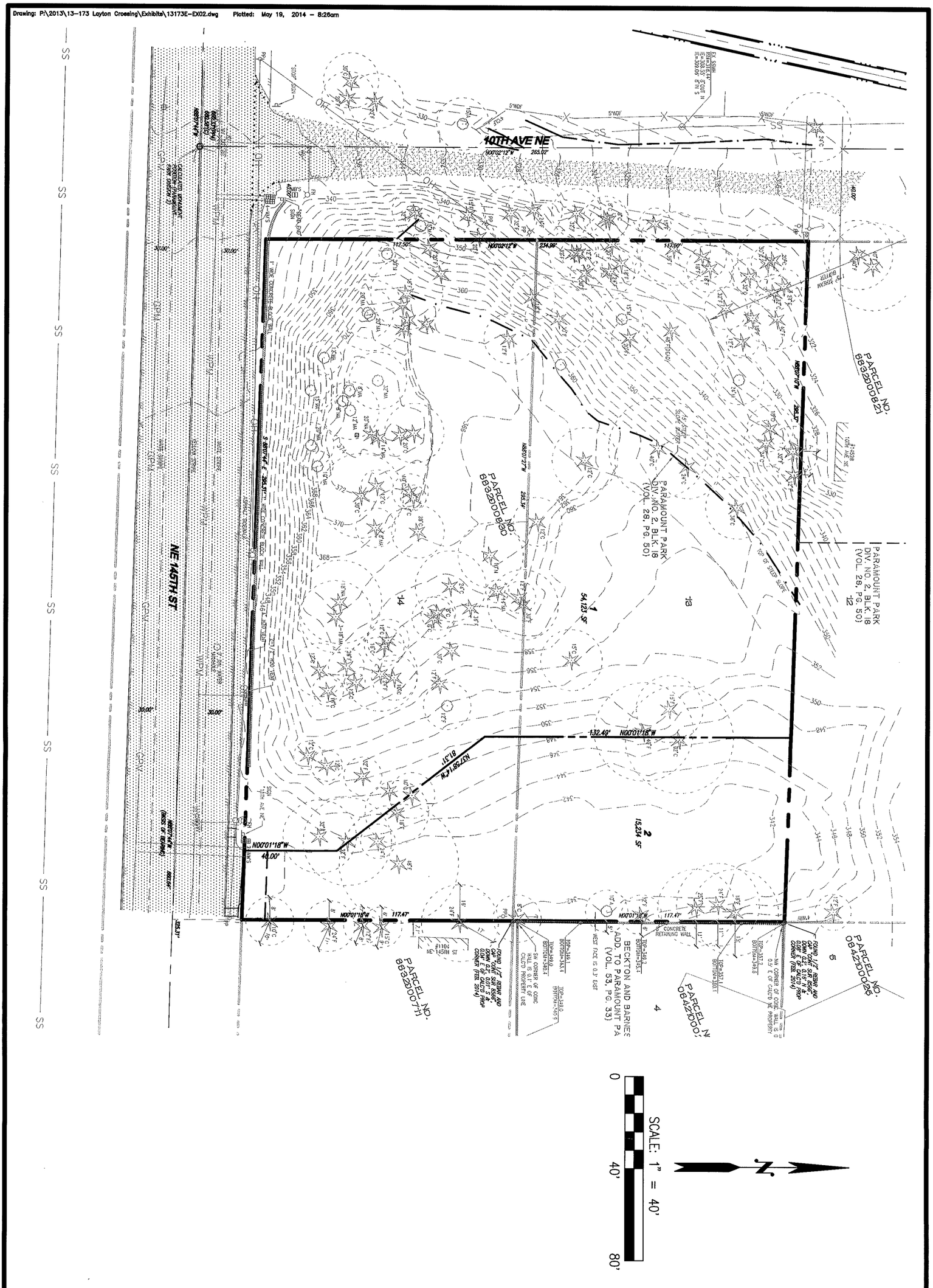


Figure 2.4.2 – Flow Chart for Determining Requirements for Redevelopment

FIGURE 2



JOB NUMBER:	13-173
DRAFTING BY:	RCR
DATE:	5-16-2014
SCALE:	1"=40'

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WYNDHAM HOMES, LLC

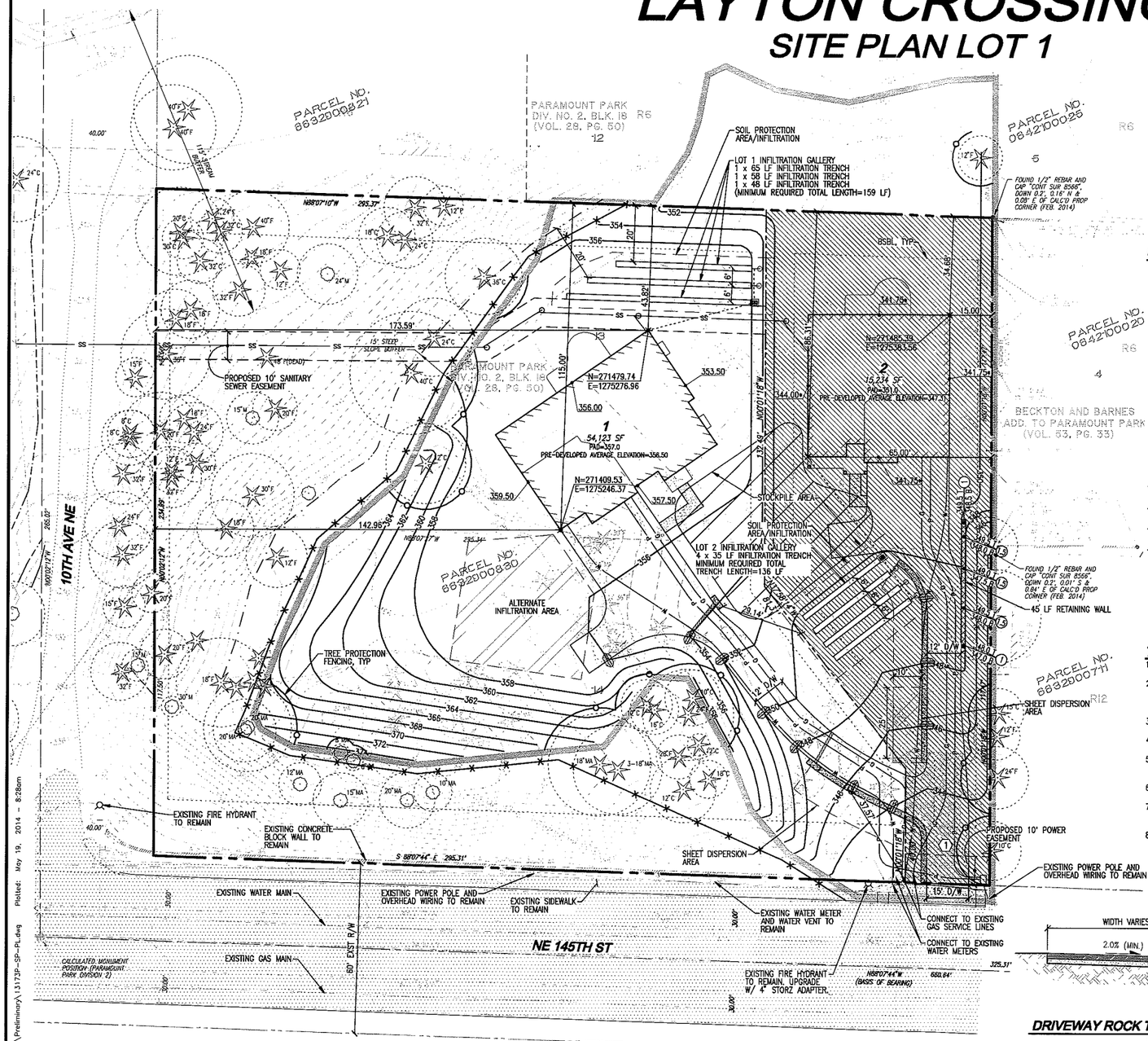
LAYTON CROSSING

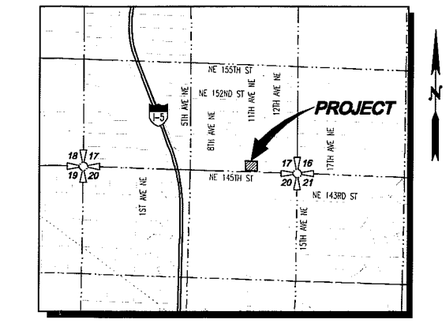
FIGURE 3A

SE 1/4, SE 1/4 OF SEC 17, TWN 26 N, RGE 4 E, W.M., CITY OF SHORELINE, KING COUNTY, WASHINGTON

LAYTON CROSSING

SITE PLAN LOT 1





VICINITY MAP
NOT TO SCALE

SCALE: 1" = 20'
20' 0 20' 40'
CONTOUR INTERVAL=2'

LEGEND AND ABBREVIATIONS

PROPOSED UTILITY SYMBOLS

SYMBOL	DESCRIPTION
	TYPE 1 CATCH BASIN, SOLID LID
	STORM DRAIN CLEANOUT
	DRAIN PIPE
	INFILTRATION TRENCH
DSPSN	DISPERSAL PAD
	SEWER CLEANOUT
SS	SEWER SERVICE LINE
W	WATER SERVICE LINE
G	GAS SERVICE LINE
P	POWER SERVICE LINE

PROPOSED TESC SYMBOLS

SYMBOL	DESCRIPTION
CLEARING AREA PROTECTED AREA	CLEARING LIMITS W/ ORANGE SAFETY FENCE
	SILT FENCE
	CONVEYANCE SWALE
	TREE PROTECTIVE FENCING PER WSDOT 1-10.10-01
1	ROCK CONSTRUCTION ENTRANCE
	INSTALL CHECK DAM EVERY 100' OR 2' OF ELEVATION CHANGE

EXISTING SYMBOLS

SYMBOL	DESCRIPTION
	FOUND REBAR AS NOTED
	MONUMENT FOUND
	MONUMENT CALC'D
	FIRE HYDRANT
	GAS VALVE
	GUY ANCHOR
	GUY POLE
	SIGN
	WATER METER
	WATER VALVE
	TREE CONIFEROUS TO BE REMOVED
	TREE DECIDUOUS TO BE REMOVED
X" XXX	TREE CONIFEROUS TO REMAIN
X" XXX	TREE DECIDUOUS TO REMAIN

ABBREVIATIONS

	CHAIN LINK FENCE
	WOOD FENCE
	CALCULATED

LEGAL DESCRIPTION

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BASIS OF BEARING

NE 145TH ST AS THE BEARING N 88°07'44" PER WASHINGTON STATE PLANE COORDINATE SYSTEM NAD83(2011)-NORTH ZONE

SURVEY INSTRUMENTATION

SURVEYING PERFORMED IN CONJUNCTION WITH THIS MAPPING UTILIZED THE FOLLOWING EQUIPMENT AND PROCEDURES:

5" ROBOTIC TOTAL STATION MAINTAINED TO MANUFACTURE'S SPECIFICATIONS AS REQUIRED BY WAC-332-130-100.

PROCEDURE USED: FIELD TRAVERSE WITH ACCURACY MEETING OR EXCEEDING THE REQUIREMENTS OF WAC-332-130-090.

REFERENCES

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PLAT OF PELICAN PARK, DIVISION 4, RECORDED IN VOLUME 50 OF PLATS, PAGE 28, IN KING COUNTY, WASHINGTON.

PLAT OF BECKTON AND BARNES ADDITION TO PARAMOUNT PARK, RECORDED IN VOLUME 53 OF PLATS, PAGE 33, IN KING COUNTY, WASHINGTON.

PLAT OF PARAMOUNT PARK DIVISION 2, RECORDED IN VOLUME 28 OF PLATS, PAGE 50, IN KING COUNTY, WASHINGTON.

RECORD OF SURVEY BY D.R. STRONG, AS RECORDED UNDER AUDITORS FILE NO. 20060405900007, RECORDS OF KING COUNTY.

TREE PROTECTION PLAN

1. VINYL FENCING TO BE INSTALLED AND MAINTAINED AT DRIPLINE.
2. IF CONSTRUCTION MUST OCCUR WITHIN THE DRIPLINE, ADJUST FENCING TO PROTECT TREE. NO MORE THAN 1/3 OF THE DRIPLINE ZONE SHALL BE IMPACTED.
3. AT NO TIME SHALL EQUIPMENT ENTER INTO THE ROOT PROTECTION ZONE (RPZ).
4. ALL BRUSH CLEANUP WITHIN THE ROOT PROTECTION ZONE SHALL BE DONE BY HAND.
5. NO CUTS OR FILLS OF UTILITY TRENCHING, MODIFICATIONS TO DRAINAGE, ETC. SHALL IMPACT THE RPZ.
6. NO WIRES, CABLES OR OTHER DEVICES SHOULD BE ATTACHED TO TREES DURING CONSTRUCTION.
7. IF A PORTION LESS THAN 1/3 OF FEEDER ROOT ZONE MUST BE IMPACTED, ROOTS SHALL BE PRUNED CLEANLY.
8. SEVERANCE OF ROOTS LARGER THAN 2" DIA. REQUIRES LANDSCAPE ARCHITECT'S APPROVAL.

PROJECT INFORMATION

SITE ADDRESS:	14521 11TH AVE NE SHORELINE, WA 98155
TAX PARCELS:	6632900-0830
SITE AREA:	69,357 SF 1.59 AC
ZONING:	R6
EXISTING USE:	VACANT
PROPOSED USE:	2 – SINGLE FAMILY LOTS
CURRENT ZONING:	R6
PROPOSED ZONING:	R6
WATER:	NORTH CITY WATER DISTRICT
SEWER:	RONALD WASTEWATER DISTRICT
POWER:	SEATTLE CITY LIGHT
GAS:	PUGET SOUND ENERGY
TELEPHONE:	VERIZON
SCHOOL DISTRICT:	SHORELINE SCHOOL DISTRICT
FIRE DISTRICT:	SHORELINE FIRE DISTRICT
MAX BUILDING HEIGHT:	35 FT

SETBACKS

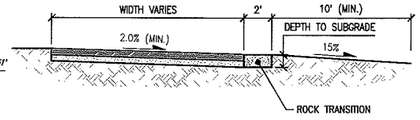
FRONT: 20'
REAR: 15'
SIDE: 5' MIN AND 15' TOTAL SUM OF TWO

IMPERVIOUS AREAS

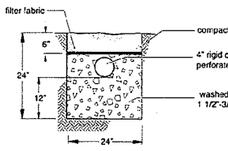
IMPERVIOUS COVER	EXISTING (SF)	PROPOSED (SF) LOT 1	LOT 2	TOTAL
DRIVEWAYS	0	2,910	2,637	5,547
MAIN FLOOR	0	2,118	1,814	3,932
GARAGE	0	774	681	1,455
EVES	0	238	212	450
WALK/PATIOS	0	375	375	750
FRONT PORCHES	0	45	127	172
TOTAL IMPERVIOUS	0	6,460	5,846	12,306
TOTAL SITE AREA	69,357	54,123	15,234	69,357
% IMPERVIOUS	0.00%	11.94%	38.37%	17.74%

RETAINING WALL AREAS

	EXISTING (SF)	PROPOSED (SF)
PROJECTED AREA	247	310



DRIVEWAY ROCK TRANSITION WIDTH DETAIL
NOT TO SCALE



SECTION A
NTS

INFILTRATION TRENCH
NOT TO SCALE

CONTACT LIST

OWNER/APPLICANT:	ENGINEER:	SURVEYOR:
WYNDHAM HOMES, LLC	LDC, INC.	LDC, INC.
16108 ASH WAY, SUITE 201	14201 NE 200TH ST #100	14201 NE 200TH ST #100
LYNNWOOD, WA 98087	WOODINVILLE, WASHINGTON 98072	WOODINVILLE, WASHINGTON 98072
CONTACT: BILL KEITH	CONTACT: MATTHEW MERRITT, PE	CONTACT: VANCE BLUE, PLS
PHONE: (425) 775-8661	PHONE: (425) 806-1869	PHONE: (425) 806-1869
EMAIL: BILL@SUNDQUISTHOMES.COM	FAX: (425) 482-2893	FAX: (425) 482-2893
	EMAIL: MMERRITT@LDCCORP.COM	EMAIL: VBLUE@LDCCORP.COM

EARTHWORK QUANTITIES

LOT	CUT (CY)	FILL (CY)	SITE STRIPPINGS (CY)
1	2,800	900	352
2	0	4,400	497

DISTURBED AREA

LOT	DISTURBED AREA (SF)	DISTURBED AREA (AC)
1	28,050	0.64
2	15,234	0.35
OFFSITE	1,510	0.03

SIGNIFICANT TREE SUMMARY

LOT	RETAINED	% RETAINED	REMOVED	% REMOVED
1 NON-CRITICAL	18	38.30%	29	61.70%
1 CRITICAL	32	100.00%	0	0.00%
1 TOTAL	50	63.29%	29	36.71%
2 TOTAL	0	0.00%	8	100.00%
1 & 2 COMBINED	50	57.47%	37	42.53%

TESC NOTES

1. SOIL PROTECTION AREAS TO BE PROTECTED FROM REGULAR HEAVY VEHICLE TRAFFIC TO PRESERVE HYDRAULIC CONDUCTIVITY OF SOIL.
2. TESC BMP'S: C220 (STRAW WADDLE), C233 (SILT FENCE), C105 (STABILIZED CONSTRUCTION ENTRANCE), C207 (ROCK CHECK DAM).
3. STOCKPILE AREA/SOILS TO BE COVERED IF NOT USED WITHIN 24 HOURS.
4. ALL DISTURBED AREAS NOT PROPOSED FOR IMPERVIOUS COVER TO BE AUGMENTED/TREATED TO MEET DOE BMP T5.13.

INFILTRATION TRENCH

1. INFILTRATION TRENCH PER DOE STANDARD DETAIL 3.1.2
2. MINIMUM SETBACK FROM STEEP SLOPE = 20 FT
3. TRENCH SIZING BASED ON EXISTING SOILS: LOAMY SAND (SEE GEOTECHNICAL REPORT AND DOE MANUAL VOLUME III, BMP 5.10A FOR TRENCH SIZING)
4. SIZING: 75 LF/1,000 SF ROOF AREA
5. FILL SOILS IN INFILTRATION AREAS TO BE PER GEOTECHNICAL RECOMMENDATION TO ACHIEVE 6"/HOUR MEASURED INFILTRATION.

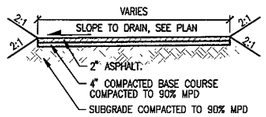
DISPERSION TRENCH/PADS

1. DISPERSION TRENCH/PADS PER DOE BMP T5.11

LOT ELEVATION/HEIGHT SUMMARY

LOT 1 "PRE-DEVELOPED" PAD ELEVATION=356.50
LOT 2 "PRE-DEVELOPED" PAD ELEVATION=347.31
LOT 1 MAX BUILD HEIGHT=391.50 (357+35' MAX HEIGHT)
LOT 1 PROPOSED BUILD HEIGHT=383.30
LOT 2 MAX BUILD HEIGHT=385.31
LOT 2 PROPOSED BUILD HEIGHT=380.25

» 3 FT OF ELEVATION HAS BEEN ADDED TO LOT 2 PAD ELEVATIONS TO GENERATE "PRE-DEVELOPED" GRADES PER GEOTECHNICAL REPORT/SITE ASSESSMENT.



DRIVEWAY SECTION

TOPOGRAPHIC DISCLAIMER

THE TOPOGRAPHIC SURVEY WAS PERFORMED BY LDC, INC. IN MARCH 2014. ANY CHANGES TO THE SITE AFTER THIS DATE WILL NOT BE REFLECTED IN THE PLANS. ANY DISCREPANCIES FOUND BETWEEN WHAT IS SHOWN ON THE PLANS AND WHAT IS NOTED IN THE FIELD SHOULD BE BROUGHT IMMEDIATELY TO THE ATTENTION OF THE ENGINEER.

Call 2 Business Days Before You Dig
811 or 1-800-424-5555
Utilities Underground Location Center

REVISIONS

NO.	DATE	DESCRIPTION	BY

FIGURE 3B

LDC
THE CIVIL ENGINEERING GROUP
Engineering Structural Planning Survey
14201 NE 200th St., #100 Woodinville, WA 98072
Ph. 425.806.1869 Fx. 425.482.2893
www.LDCcorp.com

WYNDHAM HOMES, LLC

LAYTON CROSSING
2 LOTS (SHORELINE)
SITE PLAN LOT 1

MATTHEW MERRITT STATE OF WASHINGTON 45648 REGISTERED PROFESSIONAL ENGINEER

JOB NUMBER:	13-173
DRAWING NAME:	13173P-SP-PL
DESIGNER:	MWM
DRAFTING BY:	RCR
DATE:	4-2-14
SCALE:	1"=20'
JURISDICTION:	SHORELINE

SP-01

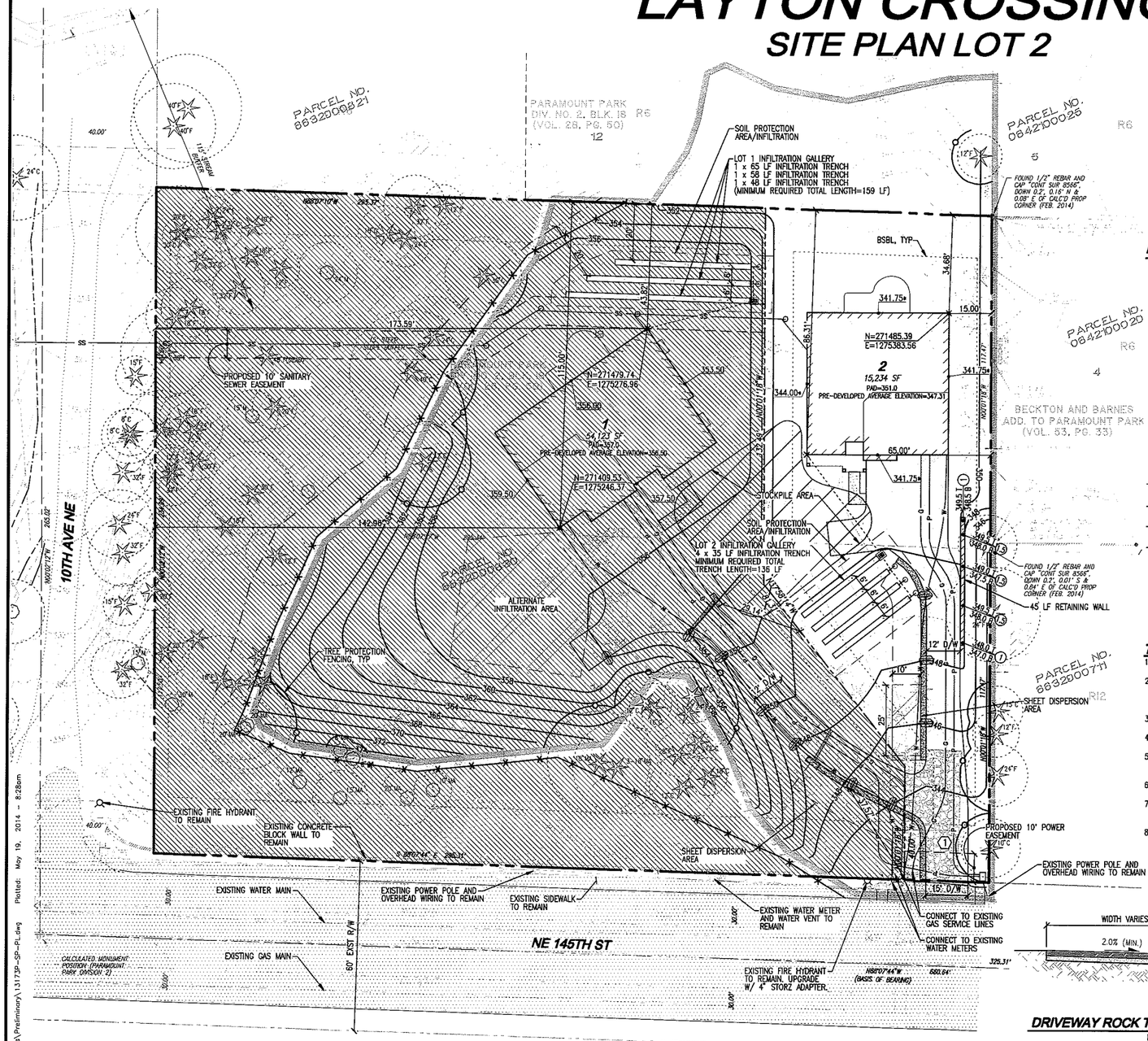
SHEET 1 OF 2

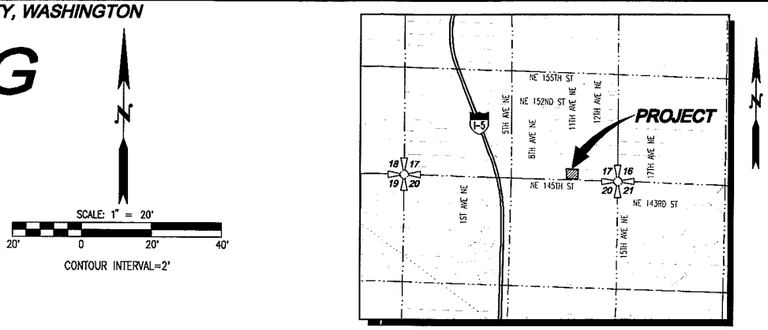
Drawing: P:\2013\13-173 Layton Crossing\Drawings\Preliminary\13173P-SP-PL.dwg Plotted: May 19, 2014 - 8:28am

SE 1/4, SE 1/4 OF SEC 17, TWN 26 N, RGE 4 E, W.M., CITY OF SHORELINE, KING COUNTY, WASHINGTON

LAYTON CROSSING

SITE PLAN LOT 2





VICINITY MAP

NOT TO SCALE

SCALE: 1" = 20'

20' 0 20' 40'

CONTOUR INTERVAL=2'

LEGEND AND ABBREVIATIONS

PROPOSED UTILITY SYMBOLS

SYMBOL	DESCRIPTION
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	DRAIN PIPE
	INFILTRATION TRENCH
DSPSL	DISPERSAL PAD
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	GUY ANCHOR
	GUY POLE
	SIGN
	WATER METER
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ABBREVIATIONS

CHAIN LINK FENCE

WOOD FENCE

CALCULATED

LEGAL DESCRIPTION

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PLAT OF PELICAN PARK, DIVISION 3, RECORDED IN VOLUME 49 OF PLATS, PAGE 78, IN KING COUNTY, WASHINGTON.

PLAT OF PELICAN PARK, DIVISION 4, RECORDED IN VOLUME 50 OF PLATS, PAGE 28, IN KING COUNTY, WASHINGTON.

PLAT OF BECKTON AND BARNES ADDITION TO PARAMOUNT PARK, RECORDED IN VOLUME 53 OF PLATS, PAGE 33, IN KING COUNTY, WASHINGTON.

PLAT OF PARAMOUNT PARK, DIVISION 2, RECORDED IN VOLUME 28 OF PLATS, PAGE 50, IN KING COUNTY, WASHINGTON.

RECORD OF SURVEY BY D.R. STRONG, AS RECORDED UNDER AUDITORS FILE NO. 20060405900007, RECORDS OF KING COUNTY.

TREE PROTECTION PLAN

1. VINYL FENCING TO BE INSTALLED AND MAINTAINED AT DRIPLINE.
2. IF CONSTRUCTION MUST OCCUR WITHIN THE DRIPLINE, ADJUST FENCING TO PROTECT TREE. NO MORE THAN 1/3 OF THE DRIPLINE ZONE SHALL BE IMPACTED.
3. AT NO TIME SHALL EQUIPMENT ENTER INTO THE ROOT PROTECTION ZONE (RPZ).
4. ALL BRUSH CLEANUP WITHIN THE ROOT PROTECTION ZONE SHALL BE DONE BY HAND.
5. NO CUTS OR FILLS OF UTILITY TRENCHING, MODIFICATIONS TO DRAINAGE, ETC. SHALL IMPACT THE RPZ.
6. NO WIRES, CABLES OR OTHER DEVICES SHOULD BE ATTACHED TO TREES DURING CONSTRUCTION.
7. IF A PORTION LESS THAN 1/3 OF FEEDER ROOT ZONE MUST BE IMPACTED, ROOTS SHALL BE PRUNED CLEANLY.
8. SEVERANCE OF ROOTS LARGER THAN 2" DIA. REQUIRES LANDSCAPE ARCHITECT'S APPROVAL.

PROJECT INFORMATION

SITE ADDRESS:	14521 11TH AVE NE SHORELINE, WA 98155
TAX PARCELS:	663290-0830
SITE AREA:	69,357 SF 1.59 AC
ZONING:	R6
EXISTING USE:	VACANT
PROPOSED USE:	2 - SINGLE FAMILY LOTS
CURRENT ZONING:	R6
PROPOSED ZONING:	R6
WATER:	NORTH CITY WATER DISTRICT
SEWER:	RONALD WASTEWATER DISTRICT
POWER:	SEATTLE CITY LIGHT
GAS:	PUGET SOUND ENERGY
TELEPHONE:	VERIZON
SCHOOL DISTRICT:	SHORELINE SCHOOL DISTRICT
FIRE DISTRICT:	SHORELINE FIRE DISTRICT
MAX BUILDING HEIGHT:	35 FT

SETBACKS

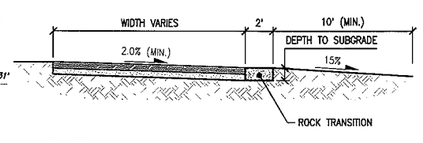
FRONT: 20'
REAR: 15'
SIDE: 5' MIN AND 15' TOTAL SUM OF TWO

IMPERVIOUS AREAS

IMPERVIOUS COVER	EXISTING (SF)	PROPOSED (SF) LOT 1	LOT 2	TOTAL
DRIVEWAYS	0	2,910	2,637	5,547
MAIN FLOOR	0	2,118	1,814	3,932
GARAGE	0	774	681	1,455
EVES	0	238	212	450
WALK/PATIOS	0	375	375	750
FRONT PORCHES	0	45	127	172
TOTAL IMPERVIOUS	0	6,460	5,846	12,306
TOTAL SITE AREA	69,357	54,123	15,234	69,357
% IMPERVIOUS	0.00%	11.94%	38.37%	17.74%

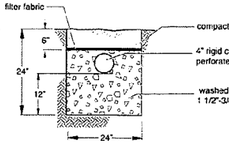
RETAINING WALL AREAS

	EXISTING (SF)	PROPOSED (SF)
PROJECTED AREA	247	310



DRIVEWAY ROCK TRANSITION WIDTH DETAIL

NOT TO SCALE



SECTION A
NTS

INFILTRATION TRENCH

NOT TO SCALE

CONTACT LIST

OWNER/APPLICANT:
WYNDHAM HOMES, LLC
16108 ASH WAY, SUITE 201
LYNNWOOD, WA 98087
CONTACT: BILL KEITH
PHONE: (425) 775-8661
EMAIL: BILL@SUNDQUISTHOMES.COM

ENGINEER:
LDC, INC.
14201 NE 200TH ST #100
WOODINVILLE, WASHINGTON 98072
CONTACT: MATTHEW MERRITT, PE
PHONE: (425) 806-1869
FAX: (425) 482-2893
EMAIL: MMERRITT@LDCCORP.COM

SURVEYOR:
LDC, INC.
14201 NE 200TH ST #100
WOODINVILLE, WASHINGTON 98072
CONTACT: VANCE BLUE, PLS
PHONE: (425) 806-1869
FAX: (425) 482-2893
EMAIL: VBLUE@LDCCORP.COM

EARTHWORK QUANTITIES

LOT	CUT (CY)	FILL (CY)	SITE STRIPPINGS (CY)
1	2,800	900	352
2	0	4,400	497

DISTURBED AREA

LOT	DISTURBED AREA (SF)	DISTURBED AREA (AC)
1	28,050	0.64
2	15,234	0.35
OFFSITE	1,510	0.03

SIGNIFICANT TREE SUMMARY

LOT	RETAINED	% RETAINED	REMOVED	% REMOVED
1 NON-CRITICAL	18	38.30%	29	61.70%
1 CRITICAL	32	100.00%	0	0.00%
1 TOTAL	50	63.29%	29	36.71%
2 TOTAL	0	0.00%	8	100.00%
1 & 2 COMBINED	50	57.47%	37	42.53%

TESC NOTES

1. SOIL PROTECTION AREAS TO BE PROTECTED FROM REGULAR HEAVY VEHICLE TRAFFIC TO PRESERVE HYDRAULIC CONDUCTIVITY OF SOIL.
2. TESC BMP'S: C230 (STRAW WADDLE), C233 (SILT FENCE), C105 (STABILIZED CONSTRUCTION ENTRANCE), C207 (ROCK CHECK DAM).
3. STOCKPILE AREA/SOILS TO BE COVERED IF NOT USED WITHIN 24 HOURS.
4. ALL DISTURBED AREAS NOT PROPOSED FOR IMPERVIOUS COVER TO BE AUGMENTED/TREATED TO MEET DOE BMP T5.13.

INFILTRATION TRENCH

1. INFILTRATION TRENCH PER DOE STANDARD DETAIL 3.1.2
2. MINIMUM SETBACK FROM STEEP SLOPE = 20 FT
3. TRENCH SIZING BASED ON EXISTING SOILS: LOAMY SAND (SEE GEOTECHNICAL REPORT AND DOE MANUAL VOLUME III, BMP 5.10A FOR TRENCH SIZING)
4. SIZING: 75 LF/1,000 SF ROOF AREA
5. FILL SOILS IN INFILTRATION AREAS TO BE PER GEOTECHNICAL RECOMMENDATION TO ACHIEVE 8"/HOUR MEASURED INFILTRATION.

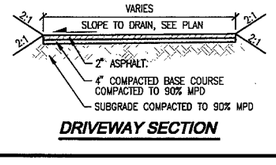
DISPERSION TRENCH/PADS

1. DISPERSION TRENCH/PADS PER DOE BMP T5.11

LOT ELEVATION/HEIGHT SUMMARY

LOT 1 "PRE-DEVELOPED" PAD ELEVATION=356.50
LOT 2 "PRE-DEVELOPED" PAD ELEVATION=347.31
LOT 1 MAX BUILD HEIGHT=391.50 (357+35' MAX HEIGHT)
LOT 1 PROPOSED BUILD HEIGHT=383.30
LOT 2 MAX BUILD HEIGHT=385.31
LOT 2 PROPOSED BUILD HEIGHT=380.25

* 3 FT OF ELEVATION HAS BEEN ADDED TO LOT 2 PAD ELEVATIONS TO GENERATE "PRE-DEVELOPED" GRADES PER GEOTECHNICAL REPORT/SITE ASSESSMENT.



DRIVEWAY SECTION

TOPOGRAPHIC DISCLAIMER

THE TOPOGRAPHIC SURVEY WAS PERFORMED BY LDC, INC. IN MARCH 2014. ANY CHANGES TO THE SITE AFTER THIS DATE WILL NOT BE REFLECTED IN THE PLANS. ANY DISCREPANCIES FOUND BETWEEN WHAT IS SHOWN ON THE PLANS AND WHAT IS NOTED IN THE FIELD SHOULD BE BROUGHT IMMEDIATELY TO THE ATTENTION OF THE ENGINEER.

Call 2 Business Days Before You Dig
811 or 1-800-424-5555
Utilities Underground Location Center

REVISIONS

NO.	DATE	DESCRIPTION	BY

FIGURE 3C

LDC
Engineering
Structural
Planning
Survey
THE CIVIL ENGINEERING GROUP
14201 NE 200th St., #100
Woodinville, WA 98072
Ph. 425.806.1869
Fx. 425.482.2893
www.LDCcorp.com

WYNDHAM HOMES, LLC

LAYTON CROSSING
2 LOTS (SHORELINE)
SITE PLAN LOT 2

MATTHEW MERRITT
STATE OF WASHINGTON
45648
REGISTERED PROFESSIONAL ENGINEER

JOB NUMBER:	13-173
DRAWING NAME:	13173P-SP-PL
DESIGNER:	MWM
DRAFTING BY:	RCR
DATE:	4-2-14
SCALE:	1"=20'
JURISDICTION:	SHORELINE

SP-02

SHEET 2 OF 2

Drawing: P:\2013\13-173 Layton Crossing\Drawings\Preliminary\13173P-SP-PL.dwg Plotted: May 19, 2014 - 8:28am

2.0 MINIMUM REQUIREMENTS

This project is designed based on the 2012 City of Shoreline EDM, and 2012 Stormwater Management Manual for Western Washington (DOE Manual)by reference, and revisions to the DOE Manual by City of Shoreline. Figure 2, City of Shoreline Surface Water Assessment Worksheet, and Figure 2A from the DOE Manual was utilized to determine the minimum requirements for the subject project which will add more than 5,000 square feet of Impervious surface to both Lots 1 and 2 individually, but less than 5000SF of PGIS and less than 10,000SF of new plus replaced impervious on either Lot 1 or Lot 2. Minimum requirements 1-9 apply to the new impervious surfaces and converted pervious surfaces (see Figure 2) for each Lot. The minimum requirements are addressed as follows.

Requirement #1: Preparation of Stormwater Site Plans

This drainage report and the submitted Site Plans for Lots 1 and 2 together contain all information required by Stormwater Site Plans listed in Chapter 3, Volume I of the 2012 Ecology Manual, and that information required by the City of Shoreline Engineering Development Manual (EDM), and checklists provided by City of Shoreline for Building Permit Submittals.

Requirement #2: Construction Stormwater Pollution Prevention (CSWPP)

A Temporary Stormwater Erosion Control Plan is included as part of the Building Permit Site Plan documents. Notes and direction concerning Construction Period Stormwater control and protections are included on Lot 1 and Lot 2 Site Plans.

Requirement #3: Source Control of Pollution

As residential development, permanent Source control BMP's are not required by the 2012 DOE manual (as the permanent site use is not described as Commercial, Industrial, Multifamily, Boatyard, Sand and Gravel Mining, and per Volume 1 Section 4.2). Source control BMP's as necessary and as required during construction operations are discussed in the SWPPP, and comply with Volume 2 of the 2012 DOE Manual.

Requirement #4: Preservation of Natural Drainage System and Outfalls

Natural drainage patterns will be maintained and discharges from the project site will occur at the natural locations (northerly and westerly for rainfall/runoff from the steep slope area, and sheet flow east over the property line for Lot 2, and some sheet flow into the NE 145th St. ROW. As proposed impervious cover is to be completely infiltrated based on the simplified sizing tools provided for Onsite Stormwater Management BMP's. The proposed discharge of the site's runoff will not cause significant adverse impact to downstream receiving waters and down gradient properties.

Requirement #5: On-Site Stormwater Management

On site stormwater management BMP's consistent with DOE Volume 1 Section 2.5.5 (List #2) are identified below:

LAWN/LANDSCAPE:

- BMP T5.13 (all non-impervious/non-structural disturbed areas to be compost augmented or treated as required)

ROOFS:

- BMP T5.10A (Downspout Full Infiltration)
  (higher order practices - BMP T5.30, is not feasible based on site/structural proximity to property lines or to steep slope areas or their buffers within a zone identified as having potential erosion hazards).

OTHER HARD SURFACES:

- BMP T5.12 (sheet dispersion of driveways; min. 10ft dispersal flow path), and
- BMP T5.11 (Concentrated Flow Dispursion) min dispersion length 25-ft. Full Dispersion of Other Hard surfaces cannot be accomplished based on site/structural proximity to property lines or to steep slope areas or their buffers within a zone identified as having potential erosion hazards). Permeable Pavement is not feasible due to proposed driveway slopes in excess of those identified in design limitations for BMP T5.15.

Requirement #6: Runoff Treatment

Runoff Treatment is not required as the proposed development proposes less than 5000SF of PGIS.

Requirement #7: Flow Control

Flow control is not required based on the proposed development adding less than 10,000SF of impervious surface within the threshold discharge area.

Requirement #8: Wetlands Protection

There are no wetlands on the project site, or downstream of the project site in a way that will be negatively impacted by the development.

Requirement #9: Basin / Watershed Planning

There are no adopted and implemented basin plans that include the proposed site.

Requirement #10: Operations and Maintenance

A Maintenance and Operations Manual has been created for this project, which complies with Section 2.5.10(c) of the Shorline EDM. Please refer to Appendix 10-B in Section 10.0 for this document.

3.0 SITE AND BASIN ASSESSMENT

The existing site currently consists of two separate lots, though structures existed in the past on these lots, there are presently no structures constructed on the lots. Previous development and grading on the lots for the previous structures remains evident in the landscape of both lots. Lot 1 is approximately 1.24 acres with primarily forested or grassy land cover. The proposed grading and construction within Lot 1 will disturb 0.64 acres. Lot 2 is approximately 0.35 acres with primarily forested or grassy land cover. Lot 2 grading includes a small offsite area within Paramount Park (City owned park north of proposed project) totaling 0.03acres. The proposed grading and construction within Lot 1 will disturb 0.64 acres.

Lot 1:

The Steep slopes exist on this Lot along the south, west and north property lines. The southerly steep slope was created with the construction of 145th St. and so is not identified as critical area. Slopes along the west and north of Lot 1 are between 15% and 40% and are identified as critical. Existing slopes on the developable portion of Lot 1 range from 10% to 30% from west to east and south. All drainage from Lot 1 travels overland to either the NE 145th St. ROW or to the 10th AVE NE ROW (in the case of critical slopes on the west on north) and are conveyed via overland or shallow concentrated flows into Little Creek. Proposed Grades/grading for Lot 1 are comprised of cut on the south and center portions of the lot, and fill toward the north and east. Proposed slopes will vary between 2:1 where transitioning to existing grades at the south and to Lot 2, to 0%-2% within the home pad area. General surface flow will continue in the same manner as existing conditions.

Lot 2:

The present condition and topography of Lot 2 and the park area identified for offsite grading have been excavated in the past as part of landform changes associated with previous structures/development on the site (see Geotechnical Assessment/Report provided by Earth Solutions). Among other indicators of this previous excavation and general lowering of the landform is a varying height ecology black wall along the easterly property line, and soils and landform along the Lot 1-2 property line and the

steepened "bowl" slopes within the City park area immediacy north of Lot 2. No significant upstream tributary drainage area to Lot 1 was observed, but a small portion of the park area to the north does drain into and through Lot 1. The proposed grading for Lot 1 includes filling this area previously excavated to bring it more in-line with its historic landform. This will allow sufficient fall across the site to surface drain from the park area around/through Lot 2 as proposed, and to allow more positive surface drainage toward the NE 145th ROW - the present and historic natural drainage pattern. No existing stormwater conveyance infrastructure exists within 1Ne 145th St. to carry/convey stormwater (other than the curb/gutter).

Single Family homes, driveways, and necessary utilities will be constructed on each existing Single Family Lot, and Onsite Stormwater Management Facilities will be constructed on each lot to infiltrate or manage that Lot's runoff from proposed impervious construction.

3.1 Phased Offsite Analysis

On Friday, May 16, 2014 , an off-site analysis was performed up-gradient and downstream of the proposed Lot 1 and Lot 2 construction. The analysis included inspection of the existing site and neighboring properties, inspection of the existing offsite surface conveyance system and assessment of the downstream flow path for flooding, erosion and water quality issues. Please see Appendix 3-A Basin Reconnaissance for a description of the downstream flow path. Also see Appendix 3-B for information about prior drainage complaints.

3.2 Sub-Basin Description

No significant upstream area tributary to the site was observed, but a small area of Paramount Park to the north of Lot drains onto Lot 1. The developable portion of Lot 2 drains to the east and south toward Lot 1 and the existing and proposed access to NE 145th St. Drainage from the developable portions of Lots 1 and 2 drains into the NE 145th St ROW and west toward Little Creek. The steep/critical areas of Lot 1 drain east and north over the property lines as sheet flow, into the 10th St. ROW, and across 10th street toward Little Creek.

See Appendix 3-A Basin Reconnaissance for a description of the downstream flow path.

3.3 Soils / Infiltration Rates

According to the King County Soil Surveys, and geotechnical assessment of infiltration potential of on-site soils, the site is underlain with Vashon Till, (Refer to Appendix 10-A for detailed soil information). This soil has slow to moderate runoff potential and a slight to moderate erosion potential. Slopes on the areas to be developed range from one-percent at proposed home pads, to as much as 50% (2H:1V) slopes in transition areas between Lots 1 and 2. Existing grades in the grading/development area slope slightly from west to east at an average of 12%.

Lot 1:

Proposed grades for Lot 1 will include a home sites at 0%-2% slope, draining primarily to the east and south, and transitions from existing grades within he critical slope buffer to proposed at as much as 2:1. A maximum driveway slope of 12% is proposed on Lot 1. All disturbed soils on Lo1 1 not slated for impervious or structural cover will be treated to comply with DOE BMP T5.13. Areas where fill soils are proposed, that are utilized for infiltration gallery will be soils (as identified by the Geotechnical Report, and required by DOE) capable of an in-place measured infiltration rate of 8"/Hr.

Lot 2:

Proposed grades for Lot 2 will include a home sites at 0%-2% slope, draining primarily to the south, and transitions to the existing grades within the parcel to the east at 2:1, with short lengths of landscape retaining walls. A maximum driveway slope of 12% is proposed on Lot 1. All disturbed soils on Lo1 2 not slated for impervious or structural cover will be treated to comply with DOE BMP T5.13. Areas where fill soils are proposed, that are utilized for infiltration gallery will be soils (as identified by the Geotechnical Report, and required by DOE) capable of an in-place measured infiltration rate of 8"/Hr.

See Appendix 10-A for the geotechnical report which includes design soil infiltration results.

3.4 Critical Areas and Flood Plain

As shown in the City's critical areas coverage, and observed on the October 19th, 2012 site visit, localized steep slopes exist on the site. There are no other critical areas on the site, but a stream/wetland areas is located north of the Lot 2 such that the buffer area for the wetland/creek is within the steep slope area of Lot 2. The site is not within any flood plain. See Appendix 3-C for the Critical Areas Map.

3.5 Assessment Summary

The downstream flow path was observed up to one quarter of a mile from the point of exit of existing drainage from the site. No significant impacts to the downstream conveyance are anticipated as a result of this project.

3.6 Facility Sizing and Downstream Analysis

Neither Flow Control nor Water Quality Control BMP's are required to be sized for building/grading proposed on Lots 1 or 2.

APPENDIX 3-A

BASIN RECONNAISSANCE

SUMMARY REPORTS

Basin Reconnaissance

On Friday, May 16, 2014 Upstream and Downstream Analyses were performed at the site. The weather was cloudy with light rain and approximately 62°F. The ground was relatively dry as there had been no rain for several days prior to inveswtigation. The following observations were verified during this visit.

Upstream Analysis

Lot 1 exists as a localized high point and there is no upstream offsite area contributing flow onto Lot 1. Largely due to a previous excavation of the Lot 2 area and a small area north of Lot 2 within parkland owned by City of Shoreline, a small area of the offsite parkland drains onto and through Lot 2. The upstream offsite area is approximately 0.03 acres and a discernable conveyance for this flow is not distinguishable on Lot 2. It is assumed any offsite runoff entering Lot 2 flows overland south to 145th St., or infiltrates within Lot 1.

Downstream Analysis

Runoff from both Lot 2 and the developable area of Lot 1 flows east and south into the NE 145th St. ROW where flows travel as surface flow within curb and gutter to the 10th Ave NE ROW, where they spead and cross the gravel/pavement within 10th Ave NE and then over vegetated area prior to entering Little Creek. The steep slope areas of Lot 1 also flow west and north over property lines and into 10th Ave NE, where they travel north along the drive surface, and cross the 10th Ave NE drive surface by sheet or in undefined shallow concentrations until entering Little Creek. Little Creek is a well-defined heavily vegetated stream with a rock/sand bottom and fairly gentle running slopes between the north property line and the culvert intake under NE 145th St. The creek was flowing on the day of the investigation. The intake and discharge points for the culvert passing the creek under 145h St ROW were obscured by heavy vegetation and blackberries and could not be sized and typed, and construction plans for the culvert are unavailable. Flows continue in a defined creek (Thornton Creek)on the south side of NE 145th St. on a Private Golf Course. The creek runs south and east for another 800 ft within the golf course before crossing the ¼-mile threshold. Flows continue south within the golf course.

Surface Water Facilities

- Type 1 Catch Basin
- Type 2 Catch Basin
- Downspout Drain
- Area Drain
- Yard Drain
- Type 1 Man Hole
- Type 2 Man Hole
- Type 3 Man Hole
- Energy Dissipator
- Access Riser
- Pipe Inlet
- Infiltration Pit or Drywell

1:2,400

CITY OF SHORELINE

0 112.5 225 450 ft

Map printed: May 16, 2014

APPENDIX 3-B

DRAINAGE COMPLAINTS

APPENDIX 3-C

CRITICAL AREAS MAPPING

iMAP

Legend

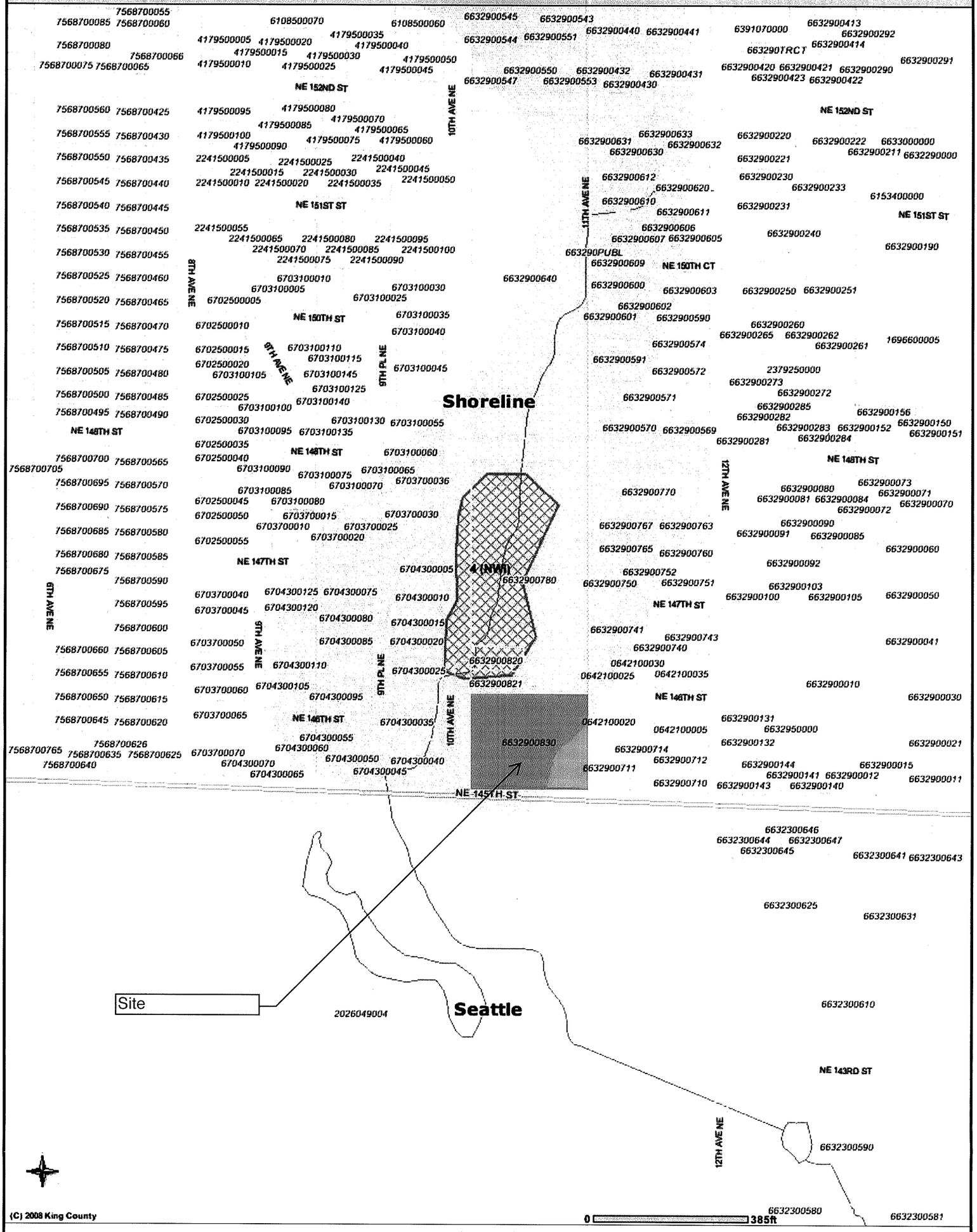
- County Boundary
- Mountain Peaks
- Drainage Studies
- Neighborhood Drainage Projects
- Regional Stormwater Facilities
- Residential Stormwater Facilities
- Commercial Stormwater Facilities
- Highways
- Incorporated Area
- Streets
- Highway
- Arterials
- Local
- Parcels
- Urban Growth Area Line
- Lakes and Large Rivers
- Streams
- Wetlands (1990 Survey)
- Drainage Complaints

COMMENTS: King County Drainage Complaints

Date: 5/15/2014 Source: King County iMAP - Stormwater (http://www.metrokc.gov/GIS/iMAP)

King County

iMAP



Legend

- County Boundary
- Mountain Peaks
- Highways
- Streets
  - Highway
  - Arterials
  - Local
- Parcels
- Lakes and Large Rivers
- Streams
- Floodway
- 100 Year Floodplain
- SAO Wetland
- SAO Landslide
- SAO Erosion
- SWDM Landslide Hazards
- Landslide Hazard
- Landslide Hazard Drainage

COMMENTS: King County Wetland and Erosion Hazard

Date: 5/15/2014 Source: King County iMAP - Sensitive Areas (http://www.metrokc.gov/GIS/iMAP)

King County

APPENDIX 3-D

NRCS SOIL INFORMATION

No NRCS information is available for this site.

See Appendix 10-A for Geotechnical Report

4.0 CONSTRUCTION STORMWATER POLLUTION PREVENTION PLAN

A copy of the Stormwater Pollution Prevention Plan (SWPPP) for the project will be submitted as a separate document. The SWPPP is modeled under the guidelines of Volume II, Section 3 of the DOE Manual, and the addendums of the 2012 City of Shoreline Engineering Development Manual (EDM).

5.0 Onsite Stormwater Management

The Low Impact Development (LID) standards for on-site stormwater management from the 2012 Stormwater Management Manual for Western Washington and those requirements as identified in the 2012 Shoreline Engineering Development Manual were considered for feasibility in the design of the project. List #2 from Chapter 2.5.5 of Volume I provides the following Best Management Practices (BMPs):

Lawn and Landscape Areas:

1. **BMP T5.13 Post-Construction Soil Quality and Depth will be utilized.**

Roofs:

1. Site proximity to steep slopes and/or property lines create an unsuitable conditions for full dispersion.
2. **BMP T5.10A Downspout Full Infiltration:** Downspout infiltration systems are designed based on 0.3"/Hr design infiltration rate provided by the geotechnincal engineer (also matches the minimum/design infiltration rate allowed/provided under the BMP design parameters in Chapter 23B of the Shoreline EDM). Infiltration galleries on Lots 1 and 2 are both in fill, where fill material is specified on the Site plan, and in the Geotechnical report or meeting infiltration rate of 8" per hour. As the infiltration trench length are based on 0.3"/hr or Silty Sand (75LF Trench/1000SF IC), the infiltration trenches are significantly longer than necessary to serve the area draining to them.

Other Hard Surfaces:

1. Permeable pavement is not feasible due to driveway slopes in excess of those indicated a maximums for Pervious Asphalt/Concrete.
2. **BMP T5.11 Concentrated Dispersion from driveway runoff:** Where BMP T5.12 cannot be implemented due to grades adjacent to driveway, Concentrated Flow dispersion per BMP T5.11 is used to disperse flows with a minimum dispersion length of 50 prior to impervious surface/roadway.
3. **BMP T5.12 Sheet dispersion of Driveways are utilized within the confines of available dispersion length/area downstream of driveways.** Not all

driveway area can be dispersed within the guidelines. Driveway which can be sheet dispersed is generally 12ft in width, which is dispersible per DOE BMP T5.12 within a 10ft buffer downstream of the rock transition width.

5.1 Source Control

Source control BMPs are not applicable to typical residential development, other than applications during construction which are temporary and discussed in the SWPPP.

6.0 Conveyance System Analysis and Design

Runoff from the proposed homes is routed to full infiltration in a roof collection tight line which is not required to be sized for conveyance. Other hard surface within Lots 1 and 2 are dispersed through Onsite Management BMP's, and other runoff from lawn/landscape areas are conveyed by sheet flow. No Conveyance system is proposed.

7.0 SPECIAL REPORTS AND STUDIES

- Geotechnical Report and Analysis (Earth Solutions)
  (See Appendix 10-A)

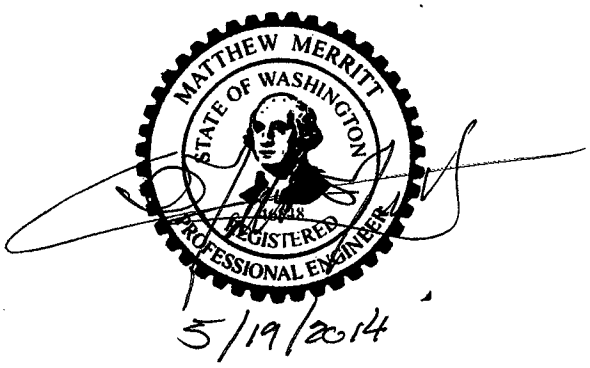
8.0 OTHER PERMITS

Other permits required for the proposed development are as follows:

- Right-of-Way Use permit (WSDOT)
- Utility Approvals (Water and Sewer)

9.0 PROJECT ENGINEER'S CERTIFICATION

I hereby state that this narrative and any calculations for Layton Crossing Lot 1 and Lot 2 have been prepared by me or under my supervision and meets the standard of care and expertise which is usual and customary in this community of professional engineers. I understand that the City of Shoreline does not and will not assume liability for the sufficiency, suitability, or performance of drainage facilities prepared by me.



10.0 APPENDICES

- Appendix 10-A: Geotechnical Report
- Appendix 10-B: Maintenance Plan

APPENDIX 10-A

GEOTECHNICAL REPORT

APPENDIX 10-B

MAINTENANCE PLAN

NO. 2 – INFILTRATION FACILITIES

Maintenance Component	Defect or Problem	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is Performed
Site	Trash and debris	Any trash and debris which exceed 1 cubic foot per 1,000 square feet (this is about equal to the amount of trash it would take to fill up one standard size office garbage can). In general, there should be no visual evidence of dumping.	Trash and debris cleared from site.
	Noxious weeds	Any noxious or nuisance vegetation which may constitute a hazard to County personnel or the public.	Noxious and nuisance vegetation removed according to applicable regulations. No danger of noxious vegetation where County personnel or the public might normally be.
	Contaminants and pollution	Any evidence of contaminants or pollution such as oil, gasoline, concrete slurries or paint.	Materials removed and disposed of according to applicable regulations. Source control BMPs implemented if appropriate. No contaminants present other than a surface oil film.
	Grass/groundcover	Grass or groundcover exceeds 18 inches in height.	Grass or groundcover mowed to a height no greater than 6 inches.
Infiltration Pond, Top or Side Slopes of Dam, Berm or Embankment	Rodent holes	Any evidence of rodent holes if facility is acting as a dam or berm, or any evidence of water piping through dam or berm via rodent holes.	Rodents removed or destroyed and dam or berm repaired.
	Tree growth	Tree growth threatens integrity of dams, berms or slopes, does not allow maintenance access, or interferes with maintenance activity. If trees are not a threat to dam, berm, or embankment integrity or not interfering with access or maintenance, they do not need to be removed.	Trees do not hinder facility performance or maintenance activities.
	Erosion	Eroded damage over 2 inches deep where cause of damage is still present or where there is potential for continued erosion. Any erosion observed on a compacted slope.	Slopes stabilized using appropriate erosion control measures. If erosion is occurring on compacted slope, a licensed civil engineer should be consulted to resolve source of erosion.
	Settlement	Any part of a dam, berm or embankment that has settled 4 inches lower than the design elevation.	Top or side slope restored to design dimensions. If settlement is significant, a licensed civil engineer should be consulted to determine the cause of the settlement.
Infiltration Pond, Tank, Vault, Trench, or Small Basin Storage Area	Sediment accumulation	If two inches or more sediment is present or a percolation test indicates facility is working at or less than 90% of design.	Facility infiltrates as designed.
Infiltration Tank Structure	Plugged air vent	Any blockage of the vent.	Tank or vault freely vents.
	Tank bent out of shape	Any part of tank/pipe is bent out of shape more than 10% of its design shape.	Tank repaired or replaced to design.
	Gaps between sections, damaged joints or cracks or tears in wall	A gap wider than ½-inch at the joint of any tank sections or any evidence of soil particles entering the tank at a joint or through a wall.	No water or soil entering tank through joints or walls.
Infiltration Vault Structure	Damage to wall, frame, bottom, and/or top slab	Cracks wider than ½-inch, any evidence of soil entering the structure through cracks or qualified inspection personnel determines that the vault is not structurally sound.	Vault is sealed and structurally sound.

NO. 2 – INFILTRATION FACILITIES

Maintenance Component	Defect or Problem	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is Performed
Inlet/Outlet Pipes	Sediment accumulation	Sediment filling 20% or more of the pipe.	Inlet/outlet pipes clear of sediment.
	Trash and debris	Trash and debris accumulated in inlet/outlet pipes (includes floatables and non-floatables).	No trash or debris in pipes.
	Damaged	Cracks wider than ½-inch at the joint of the inlet/outlet pipes or any evidence of soil entering at the joints of the inlet/outlet pipes.	No cracks more than ¼-inch wide at the joint of the inlet/outlet pipe.
Access Manhole	Cover/lid not in place	Cover/lid is missing or only partially in place. **Any open manhole requires immediate maintenance.**	Manhole access covered.
	Locking mechanism not working	Mechanism cannot be opened by one maintenance person with proper tools. Bolts cannot be seated. Self-locking cover/lid does not work.	Mechanism opens with proper tools.
	Cover/lid difficult to remove	One maintenance person cannot remove cover/lid after applying 80 lbs of lift.	Cover/lid can be removed and reinstalled by one maintenance person.
	Ladder rungs unsafe	Missing rungs, misalignment, rust, or cracks.	Ladder meets design standards. Allows maintenance person safe access.
Large access doors/plate	Damaged or difficult to open	Large access doors or plates cannot be opened/removed using normal equipment.	Replace or repair access door so it can opened as designed.
	Gaps, doesn't cover completely	Large access doors not flat and/or access opening not completely covered.	Doors close flat and covers access opening completely.
	Lifting Rings missing, rusted	Lifting rings not capable of lifting weight of door or plate.	Lifting rings sufficient to lift or remove door or plate.
Infiltration Pond, Tank, Vault, Trench, or Small Basin Filter Bags	Plugged	Filter bag more than $^1/_2$ full.	Replace filter bag or redesign system.
Infiltration Pond, Tank, Vault, Trench, or Small Basin Pre-settling Ponds and Vaults	Sediment accumulation	6" or more of sediment has accumulated.	Pre-settling occurs as designed
Infiltration Pond, Rock Filter	Plugged	High water level on upstream side of filter remains for extended period of time or little or no water flows through filter during heavy rain storms.	Rock filter replaced evaluate need for filter and remove if not necessary.
Infiltration Pond Emergency Overflow Spillway	Rock missing	Only one layer of rock exists above native soil in area five square feet or larger, or any exposure of native soil at the top of out flow path of spillway. Rip-rap on inside slopes need not be replaced.	Spillway restored to design standards.
	Tree growth	Tree growth impedes flow or threatens stability of spillway.	Trees removed.

NO. 5 - CATCH BASINS

Maintenance Component	Defect	Conditions When Maintenance is Needed	Results Expected When Maintenance is performed
General	Trash & Debris (Includes Sediment)	Trash or debris of more than 1/2 cubic foot which is located immediately in front of the catch basin opening or is blocking capacity of the basin by more than 10%	No Trash or debris located immediately in front of catch basin opening.
		Trash or debris (in the basin) that exceeds 1/3 the depth from the bottom of basin to invert the lowest pipe into or out of the basin.	No trash or debris in the catch basin.
		Trash or debris in any inlet or outlet pipe blocking more than 1/3 of its height.	Inlet and outlet pipes free of trash or debris.
		Dead animals or vegetation that could generate odors that could cause complaints or dangerous gases (e.g., methane).	No dead animals or vegetation present within the catch basin.
		Deposits of garbage exceeding 1 cubic foot in volume	No condition present which would attract or support the breeding of insects or rodents.
	Structure Damage to Frame and/or Top Slab	Corner of frame extends more than 3/4 inch past curb face into the street (If applicable).	Frame is even with curb.
		Top slab has holes larger than 2 square inches or cracks wider than 1/4 inch (intent is to make sure all material is running into basin).	Top slab is free of holes and cracks.
		Frame not sitting flush on top slab, i.e., separation of more than 3/4 inch of the frame from the top slab.	Frame is sitting flush on top slab.
	Cracks in Basin Walls/ Bottom	Cracks wider than 1/2 inch and longer than 3 feet, any evidence of soil particles entering catch basin through cracks, or maintenance person judges that structure is unsound.	Basin replaced or repaired to design standards.
		Cracks wider than 1/2 inch and longer than 1 foot at the joint of any inlet/ outlet pipe or any evidence of soil particles entering catch basin through cracks.	No cracks more than 1/4 inch wide at the joint of inlet/outlet pipe.
	Sediment/ Misalignment	Basin has settled more than 1 inch or has rotated more than 2 inches out of alignment.	Basin replaced or repaired to design standards.

NO. 5 - CATCH BASINS (*CONTINUED*)

Maintenance Component	Defect	Conditions When Maintenance is Needed	Results Expected When Maintenance is performed
	Fire Hazard	Presence of chemicals such as natural gas, oil and gasoline.	No flammable chemicals present.
	Vegetation	Vegetation growing across and blocking more than 10% of the basin opening.	No vegetation blocking opening to basin.
		Vegetation growing in inlet/outlet pipe joints that is more than six inches tall and less than six inches apart.	No vegetation or root growth present.
	Pollution	Nonflammable chemicals of more than 1/2 cubic foot per three feet of basin length.	No pollution present other than surface film.
Catch Basin Cover	Cover Not in Place	Cover is missing or only partially in place. Any open catch basin requires maintenance.	Catch basin cover is closed
	Locking Mechanism Not Working	Mechanism cannot be opened by on maintenance person with proper tools. Bolts into frame have less than 1/2 inch of thread.	Mechanism opens with proper tools.
	Cover Difficult to Remove	One maintenance person cannot remove lid after applying 80 lbs. of lift; intent is keep cover from sealing off access to maintenance.	Cover can be removed by one maintenance person.
Ladder	Ladder Rungs Unsafe	Ladder is unsafe due to missing rungs, misalignment, rust, cracks, or sharp edges.	Ladder meets design standards and allows maintenance person safe access.
Metal Grates (If Applicable)		Grate with opening wider than 7/8 inch.	Grate opening meets design standards.
	Trash and Debris	Trash and debris that is blocking more than 20% of grate surface.	Grate free of trash and debris.
	Damaged or Missing.	Grate missing or broken member(s) of the grate.	Grate is in place and meets design standards.

NO. 10 - CONVEYANCE SYSTEMS (PIPES & DITCHES)

Maintenance Component	Defect	Conditions When Maintenance is Needed	Results Expected When Maintenance is Performed
Pipes	Sediment & Debris	Accumulated sediment that exceeds 20% of the diameter of the pipe.	Pipe cleaned of all sediment and debris.
	Vegetation	Vegetation that reduces free movement of water through pipes.	All vegetation removed so water flows freely through pipes.
	Damaged	Protective coating is damaged; rust is causing more than 50% deterioration to any part of pipe.	Pipe repaired or replaced.
		Any dent that decreases the cross section area of pipe by more than 20%.	Pipe repaired or replaced.
Open Ditches	Trash & Debris	Trash and debris exceeds 1 cubic foot per 1,000 square feet of ditch and slopes.	Trash and debris cleared from ditches.
	Sediment	Accumulated sediment that exceeds 20 % of the design depth.	Ditch cleaned/ flushed of all sediment and debris so that it matches design.
	Vegetation	Vegetation that reduces free movement of water through ditches.	Water flows freely through ditches.
	Erosion Damage to Slopes	See "Ponds" Standard No. 1	See "Ponds" Standard No. 1
	Rock Lining Out of Place or Missing (If Applicable).	Maintenance person can see native soil beneath the rock lining.	Replace rocks to design standards.
Catch Basins		See "Catch Basins: Standard No. 5	See "Catch Basins" Standard No. 5
Debris Barriers (e.g., Trash Rack)		See "Debris Barriers" Standard No.6	See "Debris Barriers" Standard No. 6

NO. 11 - GROUNDS (LANDSCAPING)

Maintenance Component	Defect	Conditions When Maintenance is Needed	Results Expected When Maintenance is Performed
General	Weeds (Nonpoisonous)	Weeds growing in more than 20% of the landscaped area (trees and shrubs only).	Weeds present in less than 5% of the landscaped area.
	Safety Hazard	Any presence of poison ivy or other poisonous vegetation.	No poisonous vegetation present in landscaped area.
	Trash or Litter	Paper, cans, bottles, totaling more than 1 cubic foot within a landscaped area (trees and shrubs only) of 1,000 square feet.	Area clear of litter.
Trees and Shrubs	Damaged	Limbs or parts of trees or shrubs that are split or broken which affect more than 25% of the total foliage of the tree or shrub.	Trees and shrubs with less than 5% of total foliage with split or broken limbs.
		Trees or shrubs that have been blown down or knocked over.	Tree or shrub in place free of injury.
		Trees or shrubs which are not adequately supported or are leaning over, causing exposure of the roots.	Tree or shrub in place and adequately supported; remove any dead or diseased trees.

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